



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/763,315	01/23/2004	Shinya Ito	17381	7794
23389	7590	09/06/2005	EXAMINER	
SCULLY SCOTT MURPHY & PRESSER, PC 400 GARDEN CITY PLAZA SUITE 300 GARDEN CITY, NY 11530			SARKAR, ASOK K	
			ART UNIT	PAPER NUMBER
			2891	

DATE MAILED: 09/06/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/763,315	Applicant(s) ITO, SHINYA	
	Examiner Asok K. Sarkar	Art Unit 2891	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 August 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) 9-14 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-8 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 23 January 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>1/23/04</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

1. Applicant's election of Group I claims 1 – 8 in the reply filed on August 17, 2005 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).
2. Claims 9 – 14 were withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected Group II claims, there being no allowable generic or linking claim. Election was treated as being made **without** traverse in the reply filed on August 17, 2005.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1 – 5, 7 and 8 are rejected under 35 U.S.C. 102(b) as being anticipated by Kepler, US 6,100,145.

Regarding claim 1, Kepler teaches a method of fabricating a semiconductor device, comprising:

- (a) forming an oxide film 335 entirely over a semiconductor substrate 300 on which a MOS transistor 315 is fabricated with reference to Fig. 3B ;

Art Unit: 2891

- (b) carrying out first thermal – annealing to said semiconductor substrate is inherent step for forming the source/drain regions;
- (c) removing said oxide film 335 in an area where later mentioned semiconductor - metal compound is to be formed with reference to Fig. 3C;
- (d) forming a metal film 345 entirely over said semiconductor substrate with reference to Fig. 3D; and
- (e) carrying out second thermal – annealing to said semiconductor substrate to form semiconductor – metal compound in said area with reference to Fig. 3F in column 4, lines 25 – 65.

Regarding claim 2, Kepler teaches the method further comprising removing said metal film having been not reacted with said semiconductor substrate in column 5, lines 8 – 12.

Regarding claim 3, Kepler teaches silicon substrate and the compound is a silicide in column 4, lines 25 – 65

Regarding claim 4, Kepler teaches the metal film is cobalt in in column 4, line 55.

Regarding claim 5, Kepler teaches the oxide film is formed by CVD inherently at temperatures of 300 – 500 °C at thickness of 20 – 40 nm in column 4, lines 43 – 47.

Regarding claim 7, Kepler teaches the first thermal-annealing is carried out also for activating impurities' having been implanted into source and drain regions of said MOS transistor, and for removing defects in said source and drain regions and is inherent in the method for forming source/drain regions.

Regarding claim 8, Kepler teaches forming a trench in said semiconductor substrate; and filling said trench with oxide to define an area in which a semiconductor device is to be fabricated with reference to Fig. 3B in column 4, lines 25 – 29.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

7. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kepler, US 6,100,145 in view of Huang, 6,413,861 and Jenq, US 6,258,651.

Kepler fails to teach first thermal – annealing is carried out as spike rapid thermal annealing (RTA) by zero second in the range of 1000 to 1100 °C.

Huang teaches RTA in column 1 – 26 for the benefit of activating the dopants to form source/drain regions.

Jenq teaches the temperature for annealing the dopants in the range of near 1000 °C in column 4, lines 55 – 67 for the benefit of activating the dopants to form source/drain regions.

Therefore, it would have been obvious to one with ordinary skill in the art at the time of the invention to modify Kepler and perform first thermal – annealing as spike rapid thermal annealing (RTA) by zero second in the range of 1000 to 1100 °C for the benefit of activating the dopants to form source/drain regions as taught by Huang in column 1 – 26 and as taught by Jenq in column 4, lines 55 – 67.

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Lin, US 6,133,130; Kepler, US 6,162,689; Xiang, US 6,420,770 and Chen, US 6,468,904 teach method of forming silicide by forming the oxide layer over the substrate and removing it from selected areas for silicide formation.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Asok K. Sarkar whose telephone number is 571 272 1970. The examiner can normally be reached on Monday - Friday (8 AM- 5 PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, William B. Baumeister can be reached on 571 272 1722. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 2891

10. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Asok Kumar Sarkar

Asok K. Sarkar
September 1, 2005

Primary examiner